Release notes for ENDF/B Development photoat-098_Cf_000 evaluation

October 13, 2016

- **checkr** Warnings:

    1. A previous error halted parsing of the current section
       MAT=9800, MF= 1, MT=451 (1): Parsing stopped

        ```
        ERROR(S) FOUND IN MAT=9800, MF= 1, MT=451
            SECTION CANNOT BE CHECKED FROM SEQUENCE NUMBER     170 TO     209
        ```

- **checkr** Errors:

    1. A variable is outside the allowed ENDF range
       MAT=9800, MF= 1, MT=451 (0): Variable range

        ```
        ERROR(S) FOUND IN MAT=9800, MF= 1, MT=451
            MOD =    3 OUT OF RANGE    0 -    1          RECORD NUMBER     170
        ```

    2. Missing a section in directory so your directory is messed up. This error will break everything else
       MAT=9800, MF=23, MT=501 (0): Directory (b)

        ```
        ERROR(S) FOUND IN MAT=9800, MF=23, MT=501
            SECTION 23/501 NOT IN DIRECTORY              RECORD NUMBER     211
        ```

    3. Missing a section in directory so your directory is messed up. This error will break everything else
       MAT=9800, MF=23, MT=502 (0): Directory (b)

        ```
        ERROR(S) FOUND IN MAT=9800, MF=23, MT=502
            SECTION 23/502 NOT IN DIRECTORY              RECORD NUMBER     1294
        ```

    4. Missing a section in directory so your directory is messed up. This error will break everything else
       MAT=9800, MF=23, MT=504 (0): Directory (b)

        ```
        ERROR(S) FOUND IN MAT=9800, MF=23, MT=504
            SECTION 23/504 NOT IN DIRECTORY              RECORD NUMBER     1812
        ```

    5. Missing a section in directory so your directory is messed up. This error will break everything else
       MAT=9800, MF=23, MT=515 (0): Directory (b)

        ```
        ERROR(S) FOUND IN MAT=9800, MF=23, MT=515
            SECTION 23/515 NOT IN DIRECTORY              RECORD NUMBER     1853
        ```

    6. Missing a section in directory so your directory is messed up. This error will break everything else
       MAT=9800, MF=23, MT=516 (0): Directory (b)

        ```
        ERROR(S) FOUND IN MAT=9800, MF=23, MT=516
            SECTION 23/516 NOT IN DIRECTORY              RECORD NUMBER     1888
        ```

    7. Missing a section in directory so your directory is messed up. This error will break everything else
       MAT=9800, MF=23, MT=517 (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=9800, MF=23, MT=517
           SECTION 23/517 NOT IN DIRECTORY                    RECORD NUMBER    1943
```

8. Missing a section in directory so your directory is messed up. This error will break everything else
   MAT=9800, MF=23, MT=522 (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=9800, MF=23, MT=522
           SECTION 23/522 NOT IN DIRECTORY                    RECORD NUMBER    1985
```

9. Missing a section in directory so your directory is messed up. This error will break everything else
   MAT=9800, MF=23, MT=534 (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=9800, MF=23, MT=534
           SECTION 23/534 NOT IN DIRECTORY                    RECORD NUMBER    2484
```

10. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=9800, MF=23, MT=535 (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=9800, MF=23, MT=535
           SECTION 23/535 NOT IN DIRECTORY                    RECORD NUMBER    2503
```

11. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=9800, MF=23, MT=536 (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=9800, MF=23, MT=536
           SECTION 23/536 NOT IN DIRECTORY                    RECORD NUMBER    2524
```

12. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=9800, MF=23, MT=537 (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=9800, MF=23, MT=537
           SECTION 23/537 NOT IN DIRECTORY                    RECORD NUMBER    2546
```

13. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=9800, MF=23, MT=538 (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=9800, MF=23, MT=538
           SECTION 23/538 NOT IN DIRECTORY                    RECORD NUMBER    2569
```

14. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=9800, MF=23, MT=539 (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=9800, MF=23, MT=539
           SECTION 23/539 NOT IN DIRECTORY                    RECORD NUMBER    2593
```

15. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=9800, MF=23, MT=540 (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=9800, MF=23, MT=540
          SECTION 23/540 NOT IN DIRECTORY                    RECORD NUMBER    2619
```

16. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=9800, MF=23, MT=541 (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=9800, MF=23, MT=541
          SECTION 23/541 NOT IN DIRECTORY                    RECORD NUMBER    2646
```

17. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=9800, MF=23, MT=542 (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=9800, MF=23, MT=542
          SECTION 23/542 NOT IN DIRECTORY                    RECORD NUMBER    2674
```

18. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=9800, MF=23, MT=543 (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=9800, MF=23, MT=543
          SECTION 23/543 NOT IN DIRECTORY                    RECORD NUMBER    2702
```

19. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=9800, MF=23, MT=544 (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=9800, MF=23, MT=544
          SECTION 23/544 NOT IN DIRECTORY                    RECORD NUMBER    2728
```

20. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=9800, MF=23, MT=545 (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=9800, MF=23, MT=545
          SECTION 23/545 NOT IN DIRECTORY                    RECORD NUMBER    2758
```

21. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=9800, MF=23, MT=546 (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=9800, MF=23, MT=546
          SECTION 23/546 NOT IN DIRECTORY                    RECORD NUMBER    2788
```

22. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=9800, MF=23, MT=547 (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=9800, MF=23, MT=547
          SECTION 23/547 NOT IN DIRECTORY                    RECORD NUMBER    2825
```

23. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=9800, MF=23, MT=548 (0): Directory (b)

```
ERROR(S) FOUND IN MAT=9800, MF=23, MT=548
    SECTION 23/548 NOT IN DIRECTORY                    RECORD NUMBER    2871
```

24. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=9800, MF=23, MT=549 (0): Directory (b)

```
ERROR(S) FOUND IN MAT=9800, MF=23, MT=549
    SECTION 23/549 NOT IN DIRECTORY                    RECORD NUMBER    2931
```

25. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=9800, MF=23, MT=550 (0): Directory (b)

```
ERROR(S) FOUND IN MAT=9800, MF=23, MT=550
    SECTION 23/550 NOT IN DIRECTORY                    RECORD NUMBER    2992
```

26. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=9800, MF=23, MT=551 (0): Directory (b)

```
ERROR(S) FOUND IN MAT=9800, MF=23, MT=551
    SECTION 23/551 NOT IN DIRECTORY                    RECORD NUMBER    3020
```

27. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=9800, MF=23, MT=552 (0): Directory (b)

```
ERROR(S) FOUND IN MAT=9800, MF=23, MT=552
    SECTION 23/552 NOT IN DIRECTORY                    RECORD NUMBER    3058
```

28. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=9800, MF=23, MT=553 (0): Directory (b)

```
ERROR(S) FOUND IN MAT=9800, MF=23, MT=553
    SECTION 23/553 NOT IN DIRECTORY                    RECORD NUMBER    3091
```

29. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=9800, MF=23, MT=554 (0): Directory (b)

```
ERROR(S) FOUND IN MAT=9800, MF=23, MT=554
    SECTION 23/554 NOT IN DIRECTORY                    RECORD NUMBER    3146
```

30. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=9800, MF=23, MT=555 (0): Directory (b)

```
ERROR(S) FOUND IN MAT=9800, MF=23, MT=555
    SECTION 23/555 NOT IN DIRECTORY                    RECORD NUMBER    3202
```

31. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=9800, MF=23, MT=556 (0): Directory (b)

```
     ERROR(S) FOUND IN MAT=9800, MF=23, MT=556
        SECTION 23/556 NOT IN DIRECTORY                    RECORD NUMBER    3285
```

32. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=9800, MF=23, MT=559 (0): Directory (b)

```
     ERROR(S) FOUND IN MAT=9800, MF=23, MT=559
        SECTION 23/559 NOT IN DIRECTORY                    RECORD NUMBER    3368
```

33. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=9800, MF=23, MT=560 (0): Directory (b)

```
     ERROR(S) FOUND IN MAT=9800, MF=23, MT=560
        SECTION 23/560 NOT IN DIRECTORY                    RECORD NUMBER    3403
```

34. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=9800, MF=23, MT=561 (0): Directory (b)

```
     ERROR(S) FOUND IN MAT=9800, MF=23, MT=561
        SECTION 23/561 NOT IN DIRECTORY                    RECORD NUMBER    3443
```

35. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=9800, MF=23, MT=570 (0): Directory (b)

```
     ERROR(S) FOUND IN MAT=9800, MF=23, MT=570
        SECTION 23/570 NOT IN DIRECTORY                    RECORD NUMBER    3487
```

36. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=9800, MF=27, MT=502 (0): Directory (b)

```
     ERROR(S) FOUND IN MAT=9800, MF=27, MT=502
        SECTION 27/502 NOT IN DIRECTORY                    RECORD NUMBER    3525
```

37. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=9800, MF=27, MT=504 (0): Directory (b)

```
     ERROR(S) FOUND IN MAT=9800, MF=27, MT=504
        SECTION 27/504 NOT IN DIRECTORY                    RECORD NUMBER    3574
```

38. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=9800, MF=27, MT=505 (0): Directory (b)

```
     ERROR(S) FOUND IN MAT=9800, MF=27, MT=505
        SECTION 27/505 NOT IN DIRECTORY                    RECORD NUMBER    3625
```

39. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=9800, MF=27, MT=506 (0): Directory (b)

5

```
       ERROR(S) FOUND IN MAT=9800, MF=27, MT=506
           SECTION 27/506 NOT IN DIRECTORY                    RECORD NUMBER    3818
```

- `fudge-4.0` Warnings:

  1. generic warning message
     reaction label 0: Cf + gamma [coherent] / Product: gamma (Error # 0): Warning

     ```
     WARNING: coherentScattering is not a valid distribution component for 2-body reaction
     ```

  2. FIXME: Generic fudge unimplemented message
     reaction label 0: Cf + gamma [coherent] / Product: gamma (Error # 2): Generic unimp (c)

     ```
     WARNING: Checking not yet implemented for pointwise type data
     ```

  3. generic warning message
     reaction label 1: Cf + gamma [incoherent] / Product: gamma (Error # 0): Warning

     ```
     WARNING: incoherentScattering is not a valid distribution component for 2-body reaction
     ```

  4. FIXME: Generic fudge unimplemented message
     reaction label 1: Cf + gamma [incoherent] / Product: gamma (Error # 2): Generic unimp (c)

     ```
     WARNING: Checking not yet implemented for piecewise type data
     ```

  5. Cross sections do not correctly sum up properly according to an ENDF (or equivalent) sumrule
     summedReaction label 31: total (Error # 0): Sumrule

     ```
     WARNING: Cross section does not match sum of linked reaction cross sections! Max diff: 100.00%
     ```

  6. Cross sections do not correctly sum up properly according to an ENDF (or equivalent) sumrule
     summedReaction label 33: photoelectric absorption (Error # 0): Sumrule

     ```
     WARNING: Cross section does not match sum of linked reaction cross sections! Max diff: 74.89%
     ```

- `fudge-4.0` Errors:

  1. Calculated and tabulated thresholds don't agree
     reaction label 0: Cf + gamma [coherent] / Cross section: (Error # 0): Threshold mismatch

     ```
     WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 1. eV!
     ```

  2. 2-body reaction not in center-of-mass frame
     reaction label 0: Cf + gamma [coherent] / Product: gamma (Error # 1): 2-body not in COM

     ```
     WARNING: 2-body reaction not in center-of-mass frame!
     ```

  3. Calculated and tabulated thresholds don't agree
     reaction label 1: Cf + gamma [incoherent] / Cross section: (Error # 0): Threshold mismatch

```
WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 1. eV!
```

4. 2-body reaction not in center-of-mass frame
   reaction label 1: Cf + gamma [incoherent] / Product: gamma (Error # 1): 2-body not in COM

```
WARNING: 2-body reaction not in center-of-mass frame!
```

5. Energy range of data set does not match cross section range
   reaction label 1: Cf + gamma [incoherent] / Product: gamma / Distribution incoherentScattering - piecewise: (Error # 0): Domain mismatch (a)

```
WARNING: Domain doesn't match the cross section domain: (0.0 -> 1000000000.0) vs (1.0 -> 1e+11)
```

6. Calculated and tabulated thresholds don't agree
   reaction label 2: e- + e+ + Cf [electron field] / Cross section: (Error # 0): Threshold mismatch

```
WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 2.044e6 eV!
```

7. Calculated and tabulated thresholds don't agree
   reaction label 3: e- + e+ + Cf [nuclear field] / Cross section: (Error # 0): Threshold mismatch

```
WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 1.022e6 eV!
```

8. Calculated and tabulated thresholds don't agree
   reaction label 4: e- + Cf1s1/2 / Cross section: (Error # 0): Threshold mismatch

```
WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 135630. eV!
```

9. Calculated and tabulated thresholds don't agree
   reaction label 5: e- + Cf2s1/2 / Cross section: (Error # 0): Threshold mismatch

```
WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 26047. eV!
```

10. Calculated and tabulated thresholds don't agree
    reaction label 6: e- + Cf2p1/2 / Cross section: (Error # 0): Threshold mismatch

```
WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 25242. eV!
```

11. Calculated and tabulated thresholds don't agree
    reaction label 7: e- + Cf2p3/2 / Cross section: (Error # 0): Threshold mismatch

```
WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 19929. eV!
```

12. Calculated and tabulated thresholds don't agree
    reaction label 8: e- + Cf3s1/2 / Cross section: (Error # 0): Threshold mismatch

```
WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 6732.5 eV!
```

13. Calculated and tabulated thresholds don't agree
    reaction label 9: e- + Cf3p1/2 / Cross section: (Error # 0): Threshold mismatch

```
WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 6350.9 eV!
```

14. Calculated and tabulated thresholds don't agree
    reaction label 10: e- + Cf3p3/2 / Cross section: (Error # 0): Threshold mismatch

    ```
    WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 5103.8 eV!
    ```

15. Calculated and tabulated thresholds don't agree
    reaction label 11: e- + Cf3d3/2 / Cross section: (Error # 0): Threshold mismatch

    ```
    WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 4492.2 eV!
    ```

16. Calculated and tabulated thresholds don't agree
    reaction label 12: e- + Cf3d5/2 / Cross section: (Error # 0): Threshold mismatch

    ```
    WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 4248.1 eV!
    ```

17. Calculated and tabulated thresholds don't agree
    reaction label 13: e- + Cf4s1/2 / Cross section: (Error # 0): Threshold mismatch

    ```
    WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 1788.7 eV!
    ```

18. Calculated and tabulated thresholds don't agree
    reaction label 14: e- + Cf4p1/2 / Cross section: (Error # 0): Threshold mismatch

    ```
    WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 1609.9 eV!
    ```

19. Calculated and tabulated thresholds don't agree
    reaction label 15: e- + Cf4p3/2 / Cross section: (Error # 0): Threshold mismatch

    ```
    WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 1272.9 eV!
    ```

20. Calculated and tabulated thresholds don't agree
    reaction label 16: e- + Cf4d3/2 / Cross section: (Error # 0): Threshold mismatch

    ```
    WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 986.74 eV!
    ```

21. Calculated and tabulated thresholds don't agree
    reaction label 17: e- + Cf4d5/2 / Cross section: (Error # 0): Threshold mismatch

    ```
    WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 926.2 eV!
    ```

22. Calculated and tabulated thresholds don't agree
    reaction label 18: e- + Cf4f5/2 / Cross section: (Error # 0): Threshold mismatch

    ```
    WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 547.73 eV!
    ```

23. Calculated and tabulated thresholds don't agree
    reaction label 19: e- + Cf4f7/2 / Cross section: (Error # 0): Threshold mismatch

    ```
    WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 530.98 eV!
    ```

24. Calculated and tabulated thresholds don't agree
    reaction label 20: e- + Cf5s1/2 / Cross section: (Error # 0): Threshold mismatch

    ```
    WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 411.58 eV!
    ```

25. Calculated and tabulated thresholds don't agree
    reaction label 21: e- + Cf5p1/2 / Cross section: (Error # 0): Threshold mismatch

    `WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 337.87 eV!`

26. Calculated and tabulated thresholds don't agree
    reaction label 22: e- + Cf5p3/2 / Cross section: (Error # 0): Threshold mismatch

    `WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 251.58 eV!`

27. Calculated and tabulated thresholds don't agree
    reaction label 23: e- + Cf5d3/2 / Cross section: (Error # 0): Threshold mismatch

    `WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 142.47 eV!`

28. Calculated and tabulated thresholds don't agree
    reaction label 24: e- + Cf5d5/2 / Cross section: (Error # 0): Threshold mismatch

    `WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 129.66 eV!`

29. Calculated and tabulated thresholds don't agree
    reaction label 25: e- + Cf5f5/2 / Cross section: (Error # 0): Threshold mismatch

    `WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 10.78 eV!`

30. Calculated and tabulated thresholds don't agree
    reaction label 26: e- + Cf5f7/2 / Cross section: (Error # 0): Threshold mismatch

    `WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 9.02 eV!`

31. Calculated and tabulated thresholds don't agree
    reaction label 27: e- + Cf6s1/2 / Cross section: (Error # 0): Threshold mismatch

    `WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 60.88 eV!`

32. Calculated and tabulated thresholds don't agree
    reaction label 28: e- + Cf6p1/2 / Cross section: (Error # 0): Threshold mismatch

    `WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 38.79 eV!`

33. Calculated and tabulated thresholds don't agree
    reaction label 29: e- + Cf6p3/2 / Cross section: (Error # 0): Threshold mismatch

    `WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 25.1 eV!`

34. Calculated and tabulated thresholds don't agree
    reaction label 30: e- + Cf7s1/2 / Cross section: (Error # 0): Threshold mismatch

    `WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 5.71 eV!`

35. Calculated and tabulated thresholds don't agree
    summedReaction label 31: total / Cross section: (Error # 0): Threshold mismatch

    `WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 1. eV!`

36. Calculated and tabulated thresholds don't agree
summedReaction label 32: pair product / Cross section: (Error # 0): Threshold mismatch

```
WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 1.022e6 eV!
```

37. Calculated and tabulated thresholds don't agree
summedReaction label 33: photoelectric absorption / Cross section: (Error # 0): Threshold mismatch

```
WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 5.71 eV!
```

- `xsectplotter` Warnings:

    1. Encountered runtime warning in xsectplotter or Fudge or matplotlib
    Error: RuntimeWarning

    ```
    stderr while processing crossSection

    /usr/local/lib/python2.7/site-packages/matplotlib-1.3.1-py2.7-linux-x86_64.egg/matplotlib/pyplot.py:412: Runtime
    ... [3 more lines]
    ```